

CLAIM AMENDMENTS

1-4. (Cancelled)

5. (Currently Amended) ~~The method of claim 1, A method of processing burst information in a transmission link, comprising the steps of:~~  
~~receiving a sampled waveform containing a record of symbols imposed on a carrier signal;~~  
~~determining symbol phase of said record of symbols utilizing one or more metrics;~~  
~~processing said sample waveform to remove said carrier signal;~~  
~~calculating phase ambiguity of the burst information; and~~  
~~indexing an arrival time of the burst information;~~  
wherein said symbol phase is determined with a 5-point correlation using sinusoidal functions

6. (Cancelled)

7. (Currently Amended) ~~The method of claim 6, wherein said phase and frequency of said residual carrier is estimated in the step of processing A method of processing burst information in a transmission link, comprising the steps of:~~  
~~receiving a sampled waveform containing a record of symbols imposed on a carrier signal;~~  
~~determining symbol phase of said record of symbols utilizing one or more metrics;~~  
~~processing said sample waveform to remove said carrier signal;~~  
~~calculating phase ambiguity of the burst information; and~~  
~~indexing an arrival time of the burst information;~~  
wherein phase and frequency of a residual carrier of said carrier signal is estimated in the step of processing prior to the removal of said carrier signal and prior to a step of down-converting to remove said residual carrier.

8. (Cancelled)

9. (Currently Amended) The method of claim 8, A method of processing burst information in a transmission link, comprising the steps of:  
receiving a sampled waveform containing a record of symbols imposed on a carrier signal;  
determining symbol phase of said record of symbols utilizing one or more metrics;  
processing said sample waveform to remove said carrier signal;  
calculating phase ambiguity of the burst information; and  
indexing an arrival time of the burst information;  
wherein the step of processing further comprises a step of computing a FFT on a fixed block of symbols of said record, and wherein said fixed block of symbols is an unpadded block of symbols.

10. (Currently Amended) The method of claim 8, A method of processing burst information in a transmission link, comprising the steps of:  
receiving a sampled waveform containing a record of symbols imposed on a carrier signal;  
determining symbol phase of said record of symbols utilizing one or more metrics;  
processing said sample waveform to remove said carrier signal;  
calculating phase ambiguity of the burst information; and  
indexing an arrival time of the burst information;  
wherein the step of processing further comprises a step of computing a FFT on a fixed block of symbols of said record, and wherein said fixed block of symbols is a padded block of symbols.

11. (Cancelled)

12. (Currently Amended) The method of claim 11, A method of processing burst information in a transmission link, comprising the steps of:  
receiving a sampled waveform containing a record of symbols imposed on a carrier signal;  
determining symbol phase of said record of symbols utilizing one or more metrics;

processing said sample waveform to remove said carrier signal;  
calculating phase ambiguity of the burst information;  
indexing an arrival time of the burst information; and  
locating a unique bit pattern of symbols in said record prior to performing the steps of  
calculating and indexing;

wherein said unique bit pattern of symbols is an extended Hamming code word compatible for use in FEC decoding.

13. (Currently Amended) The method of claim 11, A method of processing burst information in a transmission link, comprising the steps of:

receiving a sampled waveform containing a record of symbols imposed on a carrier signal;  
determining symbol phase of said record of symbols utilizing one or more metrics;  
processing said sample waveform to remove said carrier signal;  
calculating phase ambiguity of the burst information; and  
indexing an arrival time of the burst information; and  
locating a unique bit pattern of symbols in said record prior to performing the steps of  
calculating and indexing, wherein said unique bit pattern of symbols is located in the locating step by further[[,]] correlating said record of symbols with one or more predetermined sequences of symbols, and selecting parameters associated with a maximum positive correlation of said record of symbols and said one or more predetermined sequences of symbols.

14. (Original) The method of claim 13, wherein said parameters in the step of selecting include a time offset value and a phase rotation value which are used to generate said maximum positive correlation.

15. (Currently Amended) The method of claim 1, A method of processing burst information in a transmission link, comprising the steps of:

receiving a sampled waveform containing a record of symbols imposed on a carrier signal;  
determining symbol phase of said record of symbols utilizing one or more metrics;

processing said sample waveform to remove said carrier signal;  
calculating phase ambiguity of the burst information; and  
indexing an arrival time of the burst information;  
wherein each record of symbols in the step of receiving is sampled at five times the symbol rate.

## 16-22. (Cancelled)

23. (Currently Amended) The apparatus of claim 19, An apparatus for processing burst information in a transmission link, comprising:  
a waveform sampler for sampling a received waveform imposed on a carrier signal, said sampled waveform having a record of symbols;  
a determinator for determining symbol phase of said record of symbols utilizing one or more metrics;  
a processor for processing said sampled waveform to remove said carrier signal;  
a resolver for determining phase ambiguity of the burst information; and  
detector for detecting a time of arrival of the burst information;  
wherein said symbol phase is determined with a 5-point correlation using sinusoidal functions.

## 24. (Cancelled)

25. (Currently Amended) The apparatus of claim 24, An apparatus for processing burst information in a transmission link, comprising:  
a waveform sampler for sampling a received waveform imposed on a carrier signal, said sampled waveform having a record of symbols;  
a determinator for determining symbol phase of said record of symbols utilizing one or more metrics;  
a processor for processing said sampled waveform to remove said carrier signal;  
a resolver for determining phase ambiguity of the burst information;  
detector for detecting a time of arrival of the burst information; and

an estimator for estimating the phase and frequency of a residual carrier of said carrier signal prior to the removal of said carrier signal, wherein said phase and frequency of the residual carrier is estimated by said estimator prior to a down-converter removing said residual carrier.

26. (Cancelled)

27. (Currently Amended) The apparatus of claim 26, An apparatus for processing burst information in a transmission link, comprising:

a waveform sampler for sampling a received waveform imposed on a carrier signal, said sampled waveform having a record of symbols;  
a determinator for determining symbol phase of said record of symbols utilizing one or more metrics;  
a processor for processing said sampled waveform to remove said carrier signal;  
a resolver for determining phase ambiguity of the burst information; and  
detector for detecting a time of arrival of the burst information;  
wherein a FFT is computed on a fixed block of symbols of said record, and wherein said fixed block of symbols is an unpadded block of symbols.

28. (Currently Amended) The apparatus of claim 26, An apparatus for processing burst information in a transmission link, comprising:

a waveform sampler for sampling a received waveform imposed on a carrier signal, said sampled waveform having a record of symbols;  
a determinator for determining symbol phase of said record of symbols utilizing one or more metrics;  
a processor for processing said sampled waveform to remove said carrier signal;  
a resolver for determining phase ambiguity of the burst information; and  
detector for detecting a time of arrival of the burst information;  
wherein a FFT is computed on a fixed block of symbols of said record, and wherein said fixed block of symbols is a padded block of symbols.

29. (Cancelled)

30. (Currently Amended) ~~The apparatus of claim 29, An apparatus for processing burst information in a transmission link, comprising:~~  
~~a waveform sampler for sampling a received waveform imposed on a carrier signal, said sampled waveform having a record of symbols;~~  
~~a determinator for determining symbol phase of said record of symbols utilizing one or more metrics;~~  
~~a processor for processing said sampled waveform to remove said carrier signal;~~  
~~a resolver for determining phase ambiguity of the burst information; and~~  
~~detector for detecting a time of arrival of the burst information;~~  
~~wherein a unique bit pattern of symbols in said record of symbols is located prior to said resolver calculating said phase ambiguity and said detector detecting said time of arrival, and~~  
~~wherein said unique bit pattern of symbols is an extended Hamming code word compatible for use in FEC decoding.~~

31. (Currently Amended) ~~The apparatus of claim 29, An apparatus for processing burst information in a transmission link, comprising:~~  
~~a waveform sampler for sampling a received waveform imposed on a carrier signal, said sampled waveform having a record of symbols;~~  
~~a determinator for determining symbol phase of said record of symbols utilizing one or more metrics;~~  
~~a processor for processing said sampled waveform to remove said carrier signal;~~  
~~a resolver for determining phase ambiguity of the burst information; and~~  
~~detector for detecting a time of arrival of the burst information;~~  
~~wherein a unique bit pattern of symbols in said record of symbols is located prior to said resolver calculating said phase ambiguity and said detector detecting said time of arrival, and~~  
~~wherein said unique bit pattern of symbols is located with a correlator by correlating said record of symbols with one or more predetermined sequences of symbols, and selecting parameters associated with a maximum positive correlation of said record of symbols and said one or more predetermined sequences of symbols.~~

32. (Original) The apparatus of claim 31, wherein said selected parameters include a time offset value and a phase rotation value which are used to generate said maximum positive correlation.

33. (Currently Amended) The apparatus of claim 19, An apparatus for processing burst information in a transmission link, comprising:

a waveform sampler for sampling a received waveform imposed on a carrier signal, said sampled waveform having a record of symbols;

a determinator for determining symbol phase of said record of symbols utilizing one or more metrics;

a processor for processing said sampled waveform to remove said carrier signal;

a resolver for determining phase ambiguity of the burst information; and

detector for detecting a time of arrival of the burst information;

wherein each said record of symbols is sampled at five times the symbol rate.

34-38. (Cancelled)

39. (Currently Amended) The method of claim 37, A method of processing burst information in a transmission link, comprising the steps of:

receiving a sampled waveform containing a record of symbols imposed on a carrier signal;

determining symbol timing of said record of symbols utilizing one or more metrics;

processing said sample waveform to remove said carrier signal by:

estimating residual carrier phase and frequency; and

down-converting to remove said carrier signal; and

determining phase ambiguity and burst arrival time by detecting a unique pattern of symbols word in said record of symbols;

wherein symbol phase of said symbol timing is determined with a 5-point correlation using sinusoidal functions.

40. (Cancelled)

41. (Currently Amended) The method of claim 40, A method of processing burst information in a transmission link, comprising the steps of:  
receiving a sampled waveform containing a record of symbols imposed on a carrier signal;  
determining symbol timing of said record of symbols utilizing one or more metrics;  
processing said sample waveform to remove said carrier signal by:  
estimating residual carrier phase and frequency; and  
down-converting to remove said carrier signal; and  
determining phase ambiguity and burst arrival time by detecting a unique pattern of symbols word in said record of symbols;  
wherein the step of processing further comprises a step of computing a FFT of a fixed block of symbols of said record, and wherein said fixed block of symbols in the step of computing is an unpadded block of symbols.

42. (Currently Amended) The method of claim 40, A method of processing burst information in a transmission link, comprising the steps of:  
receiving a sampled waveform containing a record of symbols imposed on a carrier signal;  
determining symbol timing of said record of symbols utilizing one or more metrics;  
processing said sample waveform to remove said carrier signal by:  
estimating residual carrier phase and frequency; and  
down-converting to remove said carrier signal; and  
determining phase ambiguity and burst arrival time by detecting a unique pattern of symbols word in said record of symbols;  
wherein the step of processing further comprises a step of computing a FFT of a fixed block of symbols of said record, and wherein said fixed block of symbols in the step of computing is a padded block of symbols.

43. (Currently Amended) The method of claim 37, A method of processing burst information in a transmission link, comprising the steps of:  
receiving a sampled waveform containing a record of symbols imposed on a carrier signal;  
determining symbol timing of said record of symbols utilizing one or more metrics;  
processing said sample waveform to remove said carrier signal by:  
estimating residual carrier phase and frequency; and  
down-converting to remove said carrier signal; and  
determining phase ambiguity and burst arrival time by detecting a unique pattern of symbols word in said record of symbols;  
wherein said unique pattern of symbols is an extended Hamming code word compatible for use in FEC decoding.

44-49. (Cancelled)

50. (Currently Amended) The apparatus of claim 48, An apparatus for processing burst information in a transmission link, comprising:  
a waveform sampler for sampling a received waveform imposed on a carrier signal, said sampled waveform having a record of symbols;  
a determinator for determining symbol timing of said record of symbols utilizing one or more metrics;  
a processor for processing said sampled waveform in phase and frequency to remove said carrier signal;  
a resolver for resolver phase ambiguity of the burst information; and  
a detector for detecting a time of arrival of the burst information;  
wherein symbol phase of said symbol timing is determined with a 5-point correlation using sinusoidal functions.

51. (Currently Amended) The apparatus of claim 48, further comprising An apparatus for processing burst information in a transmission link, comprising:

a waveform sampler for sampling a received waveform imposed on a carrier signal, said sampled waveform having a record of symbols;  
a determinator for determining symbol timing of said record of symbols utilizing one or more metrics;  
a processor for processing said sampled waveform in phase and frequency to remove said carrier signal;  
a resolver for resolver phase ambiguity of the burst information;  
a detector for detecting a time of arrival of the burst information; and  
an estimator for estimating the phase and frequency of a residual carrier of said carrier signal prior to the removal of said carrier signal.

52. (Currently Amended) The apparatus of claim 48, An apparatus for processing burst information in a transmission link, comprising:  
a waveform sampler for sampling a received waveform imposed on a carrier signal, said sampled waveform having a record of symbols;  
a determinator for determining symbol timing of said record of symbols utilizing one or more metrics;  
a processor for processing said sampled waveform in phase and frequency to remove said carrier signal;  
a resolver for resolver phase ambiguity of the burst information; and  
a detector for detecting a time of arrival of the burst information;  
wherein a FFT is computed on a fixed block of symbols of said record, and said fixed block of symbols is an unpadded block of symbols.

53. (Currently Amended) The apparatus of claim 48, An apparatus for processing burst information in a transmission link, comprising:  
a waveform sampler for sampling a received waveform imposed on a carrier signal, said sampled waveform having a record of symbols;  
a determinator for determining symbol timing of said record of symbols utilizing one or more metrics;

a processor for processing said sampled waveform in phase and frequency to remove said carrier signal;

a resolver for resolver phase ambiguity of the burst information; and

a detector for detecting a time of arrival of the burst information;

wherein a FFT is computed on a fixed block of symbols of said record, and said fixed block of symbols is a padded block of symbols.

54. (Currently Amended) ~~The apparatus of claim 29, wherein~~ An apparatus for processing burst information in a transmission link, comprising:

a waveform sampler for sampling a received waveform imposed on a carrier signal, said sampled waveform having a record of symbols;

a determinator for determining symbol phase of said record of symbols utilizing one or more metrics;

a processor for processing said sampled waveform to remove said carrier signal;

a resolver for determining phase ambiguity of the burst information; and

detector for detecting a time of arrival of the burst information;

wherein a unique bit pattern of symbols in said record of symbols is located prior to said resolver calculating said phase ambiguity and said detector detecting said time of arrival, and a unique bit pattern of symbols is located with a correlator by correlating said record of symbols with one or more predetermined sequences of symbols, and selecting parameters associated with a maximum positive correlation of said record of symbols and said one or more predetermined sequences of symbols.

55. (Original) The apparatus of claim 54, wherein said selected parameters include a time offset value and a phase rotation value which are used to generate said maximum positive correlation.

56. (Currently Amended) ~~The apparatus of claim 48, An apparatus for processing burst information in a transmission link, comprising:~~

a waveform sampler for sampling a received waveform imposed on a carrier signal, said sampled waveform having a record of symbols;

a determinator for determining symbol timing of said record of symbols utilizing one or more metrics;

a processor for processing said sampled waveform in phase and frequency to remove said carrier signal;

a resolver for resolver phase ambiguity of the burst information; and

a detector for detecting a time of arrival of the burst information;

wherein each said record of symbols is sampled at five times the symbol rate.

57-62. (Cancelled)

63. (Currently Amended) The method of claim 59, A method of processing burst information in a transmission link, comprising the steps of:

receiving a sampled waveform containing a record of symbols imposed on a carrier signal;

determining symbol timing of said record of symbols utilizing one or more metrics;

processing said sample waveform in phase and frequency to remove said carrier signal;

calculating phase ambiguity of the burst information; and

indexing an arrival time of the burst information;

wherein symbol phase of said symbol timing is determined in the step of determining with a 5-point correlation using sinusoidal functions.

64. (Cancelled)

65. (Currently Amended) The method of claim 64, A method of processing burst information in a transmission link, comprising the steps of:

receiving a sampled waveform containing a record of symbols imposed on a carrier signal;

determining symbol timing of said record of symbols utilizing one or more metrics;

processing said sample waveform in phase and frequency to remove said carrier signal;

calculating phase ambiguity of the burst information; and

indexing an arrival time of the burst information;

wherein said phase and frequency of a residual carrier of said carrier signal is estimated in the step of processing prior to the removal of said carrier signal and wherein said phase and frequency of said residual carrier is estimated in the step of processing prior to a step of down-converting to remove said residual carrier.

66. (Cancelled)

67. (Currently Amended) The method of claim 66, A method of processing burst information in a transmission link, comprising the steps of:  
receiving a sampled waveform containing a record of symbols imposed on a carrier signal;  
determining symbol timing of said record of symbols utilizing one or more metrics;  
processing said sample waveform in phase and frequency to remove said carrier signal;  
calculating phase ambiguity of the burst information; and  
indexing an arrival time of the burst information;  
wherein the step of processing further comprises a step of computing a FFT on a fixed block of symbols of said record, wherein said fixed block of symbols is an unpadded block of symbols.

68. (Currently Amended) The method of claim 66, A method of processing burst information in a transmission link, comprising the steps of:  
receiving a sampled waveform containing a record of symbols imposed on a carrier signal;  
determining symbol timing of said record of symbols utilizing one or more metrics;  
processing said sample waveform in phase and frequency to remove said carrier signal;  
calculating phase ambiguity of the burst information; and  
indexing an arrival time of the burst information;  
wherein the step of processing further comprises a step of computing a FFT on a fixed block of symbols of said record, wherein said fixed block of symbols is a padded block of symbols.

69. (Cancelled)

70. (Currently Amended) The method of claim 69, A method of processing burst information in a transmission link, comprising the steps of:

receiving a sampled waveform containing a record of symbols imposed on a carrier signal;

determining symbol timing of said record of symbols utilizing one or more metrics;

processing said sample waveform in phase and frequency to remove said carrier signal;

calculating phase ambiguity of the burst information;

indexing an arrival time of the burst information; and

locating a unique bit pattern of symbols in said record prior to performing the steps of calculating and indexing, wherein said unique bit pattern of symbols is an extended Hamming code word compatible for use in FEC decoding.

71. (Currently Amended) The method of claim 69, A method of processing burst information in a transmission link, comprising the steps of:

receiving a sampled waveform containing a record of symbols imposed on a carrier signal;

determining symbol timing of said record of symbols utilizing one or more metrics;

processing said sample waveform in phase and frequency to remove said carrier signal;

calculating phase ambiguity of the burst information;

indexing an arrival time of the burst information; and

locating a unique bit pattern of symbols in said record prior to performing the steps of calculating and indexing, wherein said unique bit pattern of symbols is located in the locating step by further[[,]] correlating said record of symbols with one or more predetermined sequences of symbols, and selecting parameters associated with a maximum positive correlation of said record of symbols and said one or more predetermined sequences of symbols.

72. (Original) The method of claim 71, wherein said parameters in the step of selecting include a time offset value and a phase rotation value which are used to generate said maximum positive correlation.

73. (Currently Amended) ~~The method of claim 59,~~ A method of processing burst information in a transmission link, comprising the steps of:

receiving a sampled waveform containing a record of symbols imposed on a carrier signal;

determining symbol timing of said record of symbols utilizing one or more metrics;  
processing said sample waveform in phase and frequency to remove said carrier signal;  
calculating phase ambiguity of the burst information; and  
indexing an arrival time of the burst information;

wherein each record of symbols in the step of receiving is sampled at five times the symbol rate.

74-80. (Cancelled)

81. (Currently Amended) ~~The method of claim 77,~~ A method of processing burst information in a transmission link, comprising the steps of:

receiving a sampled waveform containing a record of symbols imposed on a carrier signal;

determining symbol timing of said record of symbols utilizing one or more metrics;  
processing said sample waveform to remove said carrier signal; and  
calculating phase ambiguity and time of arrival of the burst information by midamble detection;

wherein symbol phase of said symbol timing is determined in the step of determining with a 5-point correlation using sinusoidal functions.

82. (Cancelled)

83. (Currently Amended) ~~The method of claim 82,~~ A method of processing burst information in a transmission link, comprising the steps of:

receiving a sampled waveform containing a record of symbols imposed on a carrier signal;

determining symbol timing of said record of symbols utilizing one or more metrics;  
processing said sample waveform to remove said carrier signal; and  
calculating phase ambiguity and time of arrival of the burst information by midamble  
detection;

wherein phase and frequency of a residual carrier of said carrier signal is estimated in the  
step of processing prior to the removal of said carrier signal, and wherein said phase and  
frequency of said residual carrier is estimated in the step of processing prior to a step of down-  
converting to remove said residual carrier.

84. (Cancelled)

85. (Currently Amended) The method of claim 84, A method of processing burst  
information in a transmission link, comprising the steps of:

receiving a sampled waveform containing a record of symbols imposed on a carrier  
signal;

determining symbol timing of said record of symbols utilizing one or more metrics;  
processing said sample waveform to remove said carrier signal; and  
calculating phase ambiguity and time of arrival of the burst information by midamble  
detection;

wherein the step of processing further comprises a step of computing a FFT on a fixed  
block of symbols of said record, and wherein said fixed block of symbols is an unpadded block  
of symbols.

86. (Currently Amended) The method of claim 84, A method of processing burst  
information in a transmission link, comprising the steps of:

receiving a sampled waveform containing a record of symbols imposed on a carrier  
signal;

determining symbol timing of said record of symbols utilizing one or more metrics;  
processing said sample waveform to remove said carrier signal; and  
calculating phase ambiguity and time of arrival of the burst information by midamble  
detection;

wherein the step of processing further comprises a step of computing a FFT on a fixed block of symbols of said record, and wherein said fixed block of symbols is a padded block of symbols.

87. (Currently Amended) The method of claim 77, A method of processing burst information in a transmission link, comprising the steps of:

receiving a sampled waveform containing a record of symbols imposed on a carrier signal;

determining symbol timing of said record of symbols utilizing one or more metrics;  
processing said sample waveform to remove said carrier signal; and  
calculating phase ambiguity and time of arrival of the burst information by midamble detection;

wherein said midamble is an extended Hamming code word compatible for use in FEC decoding.

88. (Cancelled)

89. (Currently Amended) The method of claim 88, A method of processing burst information in a transmission link, comprising the steps of:

receiving a sampled waveform containing a record of symbols imposed on a carrier signal;

determining symbol timing of said record of symbols utilizing one or more metrics;  
processing said sample waveform to remove said carrier signal; and  
calculating phase ambiguity and time of arrival of the burst information by midamble detection;

wherein said midamble is detected in the calculating step by further, correlating said record of symbols with one or more predetermined sequences of symbols, and selecting parameters associated with a maximum positive correlation of said record of symbols and said one or more predetermined sequences of symbols, wherein said parameters in the step of selecting include a time offset value and a phase rotation value which are used to generate said maximum positive correlation.

90. (Currently Amended) The method of claim 77, A method of processing burst information in a transmission link, comprising the steps of:  
receiving a sampled waveform containing a record of symbols imposed on a carrier signal;  
determining symbol timing of said record of symbols utilizing one or more metrics;  
processing said sample waveform to remove said carrier signal; and  
calculating phase ambiguity and time of arrival of the burst information by midamble detection;

wherein each record of symbols in the step of receiving is sampled at five times the symbol rate.

91-93. (Cancelled)